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ing California Raisins

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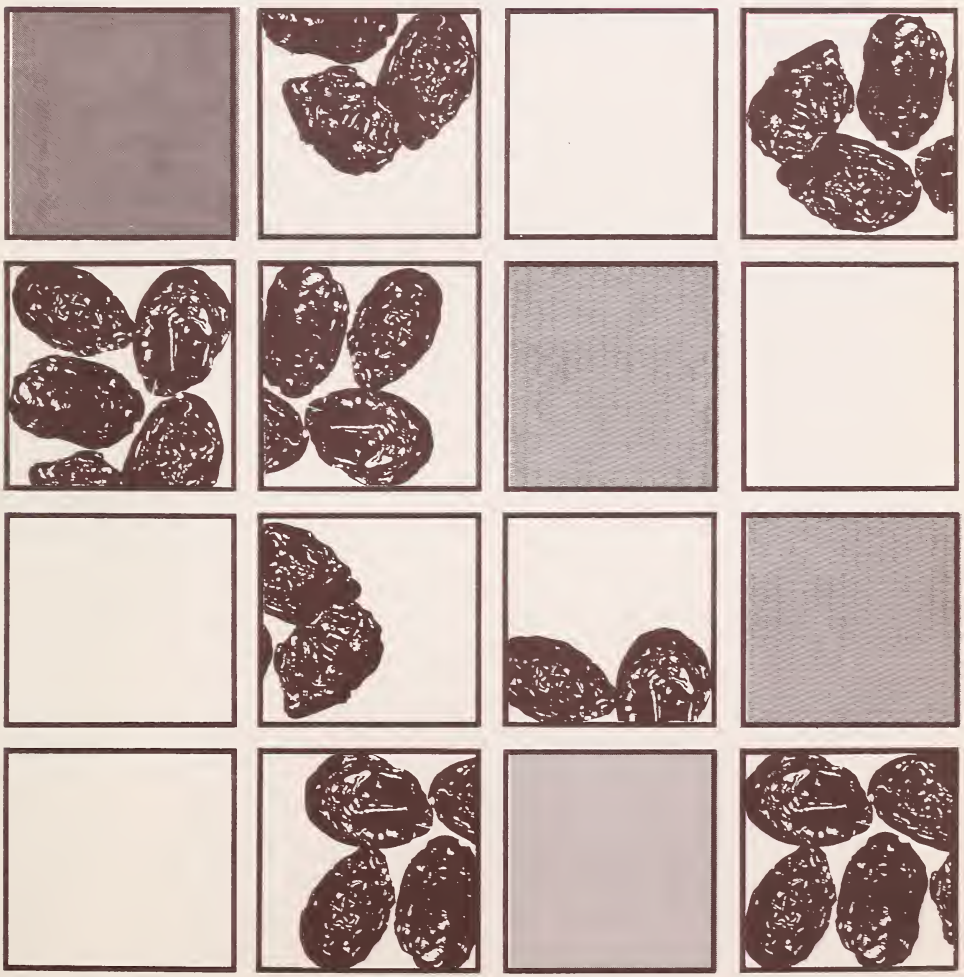

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Marketing California Raisins

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PREFACE

This bulletin briefly describes the movement of California raisins from vine to market.

Acknowledgement is made to the many people in industry and government whose information and assistance aided in preparing this bulletin, especially Ernest Bedrosian, Chairman, Raisin Advisory Board, Fresno, Calif.; Clyde E. Nef, Manager, Raisin Administrative Committee, Fresno, Calif.; John Calder, General Manager, California Raisin Advisory Board, Fresno, Calif.; Pete Christensen and Fred Swanson, Farm Advisors, Fresno County, Calif.; and Vincent E. Petrucci, Professor of Viticulture, California State University at Fresno.

INTRODUCTION

The grape has flourished since ancient times. It is native to both the old and new worlds and is used in many ways.

Early history. Grape seeds and leaves were found in fossilized coal strata that predate man's appearance on earth. The Persians and Egyptians used grapes as a source of sugar and in wine making some 2,000 years before Christ. As early as 1490 B.C., grapes were sun-dried into raisins. Around 1000 B.C., the Israelites used clusters of raisins as tax payments to King David.

The word "raisin" comes from the Latin "racemus," meaning a bunch or cluster. Old English writers used spellings such as "reysyns" in 1266; "reysons" in 1447; and "raysens" in 1542. The present spelling dates back to 1685.

American colonists found native grapes growing wild in this country. They cultivated them and named two varieties Catawba and Concord. These varieties later became leading juice grapes in the Eastern United States.

California history. The Franciscan Fathers brought the first European-type (old world) grapes to California in 1769. They planted vineyards near their missions to have grapes for fruit and for making sacramental wine. In 1851, a San Diego rancher grew the first raisin-type grape (Muscat of Alexandria) in California and produced a few raisins there as early as the 1860's. By 1870, grape production expanded to the Sacramento and San Joaquin Valleys.

During September 1873, the San Joaquin Valley experienced an extremely hot spell, so hot that the muscat grapes dried on the vines before the growers could pick them. This was the first important raisin crop, and the 60 tons were sold immediately in San Francisco as "Peruvian delicacies."

The Thompson seedless variety, originally produced in England, was first grown in Sutter County, Calif., in 1872. It is said that the entire California acreage of Thompson seedless grapes can be traced back to one original Sutter County grapevine. Because it lacked seeds, the Thompson grape made an excellent raisin, and cultivation soon spread to the San Joaquin Valley.

UNITED STATES PRODUCTION

All U.S. raisins are produced in California. Production is centered in the San Joaquin Valley within a 100-mile radius of Fresno. The San Joaquin Valley is about 50 miles wide, 240 miles long, and is almost completely surrounded by mountains.

Climate. For best development, the raisin-type grape requires long, hot, dry summers and mild winters. This type of vine cannot stand severe winters. In the San Joaquin Valley, it is warm during April, May, and June and hot from July through September. While rains are desirable to replace soil moisture during the winter, irrigation can alleviate deficiencies. Humid, cloudy, or rainy weather can affect the grape crop during the spring and summer, making it difficult to control disease and pests. If such weather occurs during the blooming period, grape yields may be lighter. Rainy weather during the ripening and harvesting seasons may cause grape damage and fruit rot. At least one month of clear, hot, rainless weather during August and September is necessary to produce sun-dried raisins.

Soil. Grapevines can adapt to a wide range of soil types. However, soils that contain high concentrations of salt, alkali, boron, or other undesirable substances are not conducive to grape production. The largest vines and heaviest crops are produced on deep, fertile soils. Raisin-type grapes are grown in California on irrigated, fertile, alluvial valley soils, varying in texture from sand to loams. Generally, the Thompson seedless grape is grown on light to medium soils and the Muscat grape on heavier soils.

Production. After the initial 1873 muscat raisin crop, the industry began to expand. The number of growers and the amount of raisins produced vary from year to year. In 1966, there were about 6,000 growers producing more than 280,000 tons of raisins. The number of growers dropped to about 4,000 in 1973 with production exceeding 220,000 tons.

USAGE, ACREAGE, AND YIELDS

Usage. California grapes normally have four outlets: as raisins, for fresh table use, in canning, and for crushing. Most crushed grapes are used for distilling and wine making. Some are used for grape concentrate.

Grape varieties are categorized according to the three major outlets: raisins, fresh table use, and crushing. Table 1 shows the production and utilization of raisin variety grapes.

Table 1.—Raisin-variety grapes: Production and utilization

Crop	Utilized production	Utilization				
		Fresh	Canned	Crushed	Dried	
					Fresh basis	Dry basis
		thousand tons, fresh basis			*thousand tons before processing*	
Averages						
1950-54	1,511.6	166.8	25.7	449.5	869.6	217.4
1955-59	1,632.0	202.2	35.5	573.7	820.6	201.2
1960-64	1,932.6	214.8	46.1	708.9	962.8	222.0
1965-69	2,135.0	240.7	60.2	764.6	1,069.4	249.2
Annual						
1965	2,575.0	246.0	54.8	979.2	1,295.0	270.0
1966	2,175.0	254.0	62.0	675.0	1,184.0	280.0
1967	1,635.0	215.0	54.0	615.0	751.0	181.0
1968	2,135.0	252.0	64.0	709.0	1,110.0	264.0
1969	2,155.0	236.7	66.3	845.0	1,007.0	251.0
1970	1,890.0	165.3	53.7	851.0	820.0	193.0
1971	2,317.0	176.6	58.4	1,204.0	878.0	191.0
1972	1,362.0	158.5	50.5	717.0	436.0	105.0
1973[1]	2,353.0	114.0	59.0	1,213.0	967.0	215.0
1974[1]	1,950.0					

[1] Preliminary.

Some grape varieties, such as the Thompson seedless, muscat, sultana, and zante currant, have multiple uses. The Thompson seedless grape, for example, is sold into each of the four outlets. Other varieties, particularly some wine grapes, are suited for use only in one of the outlets. Figure 1 shows the outlets for varieties of California grapes that are suitable for raisin production.

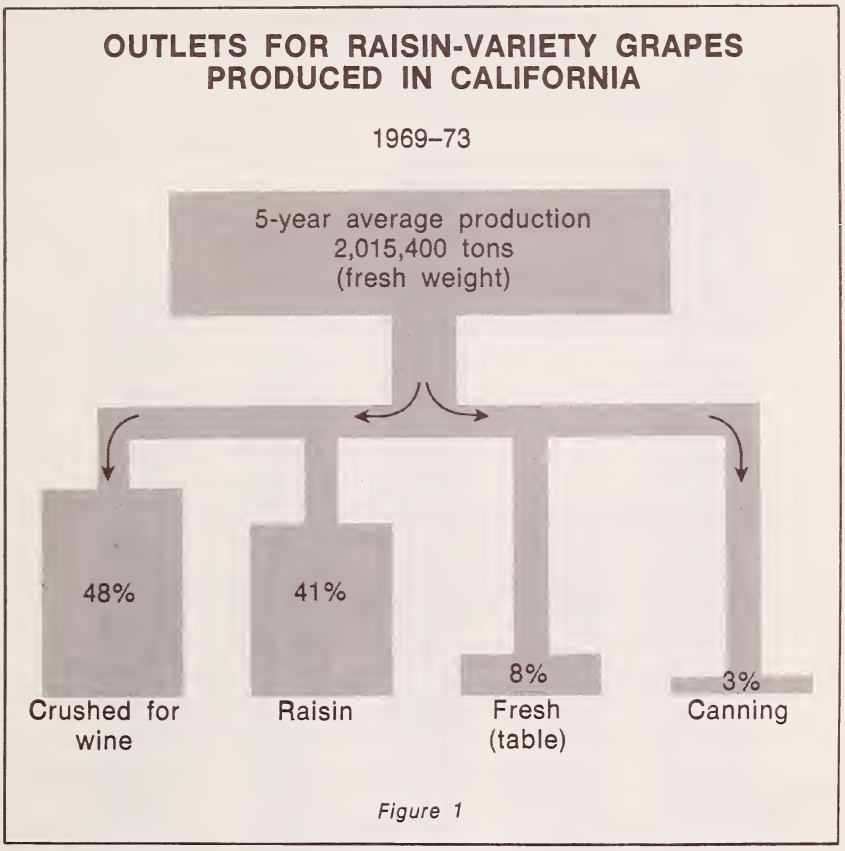

Figure 1

Acreage. Grape-bearing acreage varies as new vineyards come into production and old vineyards are phased out. The total bearing acreage in 1973 was 453,430 acres. Fifty-three percent produced raisin-variety grapes, 14 percent table-variety grapes, and 33 percent wine-variety grapes.

Nonbearing grape acreage also changes as new vineyards are planted and young vineyards begin producing. During the 1960's, nonbearing acreage decreased. However, beginning in 1970, grape plantings increased drastically. About 17,147 acres were planted in 1970, 37,996 in 1971, 58,515 in 1972, and 57,908 in 1973. The wine-variety plantings showed a significant increase, while raisin and table-grape plantings remained stable.

Table 2 shows the California raisin-grape acreage for 1973, by varieties.

Table 2.—Raisin-variety grapes: Acreage standing, by variety, California, 1973

Variety	Bearing	Nonbearing[1]	Total
		acres	
Zante currants	1,634	—	1,634
Canners[2]	104	—	104
Muscat of Alexandria	11,740	2,072	13,812
Sultanas	1,001	—	1,001
Thompson seedless	224,011	7,528	231,539
Other raisins	54	19	73
Total raisins	238,544	9,619[3]	248,163[3]

[1] Nonbearing includes plantings for 1971, 1972, and 1973.
[2] Same as Thompson canners.
[3] Included 9 acres not yet planted when surveyed but expected to be planted by January 1, 1974.

Table 3 provides background information on acreage, yield, and production for all California raisin grapes.

Table 3.—Raisin grapes: Acreage, yield, and production

Crop	Acreage			Yield per bearing acre	Utilized production
	Bearing	Nonbearing	Total		
		—acres—		*tons*	*1,000 tons*
Averages					
1950-54	228,067	7,775	235,842	6.6	1,511.6
1955-59	207,181	18,967	226,148	7.9	1,632.0
1960-64	236,577	19,278	255,855	8.2	1,932.6
1965-69	251,696	7,134	258,830	8.5	2,135.0
Annual					
1965	253,179	9,160	262,339	10.2	2,575.0
1966	253,380	8,320	261,700	8.6	2,175.0
1967	251,360	9,050	260,410	6.5	1,635.0
1968	249,810	6,030	255,840	8.5	2,135.0
1969	250,750	3,110	253,860	8.6	2,155.0
1970	245,350	3,700	249,050	7.7	1,890.0
1971	243,803	5,637	249,440	9.5	2,317.0
1972	240,385	5,964	246,349	5.7	1,362.0
1973[1]	238,544	9,619	248,163	9.9	2,353.0
1974[1]	237,460	—	—	8.2	1,950.0

[1] Preliminary.

Yields. Grape yields fluctuate from year to year. The 1969-73 yields for raisin grapes ranged from 5.7 to 9.9 tons per bearing acre, as shown in figure 2.

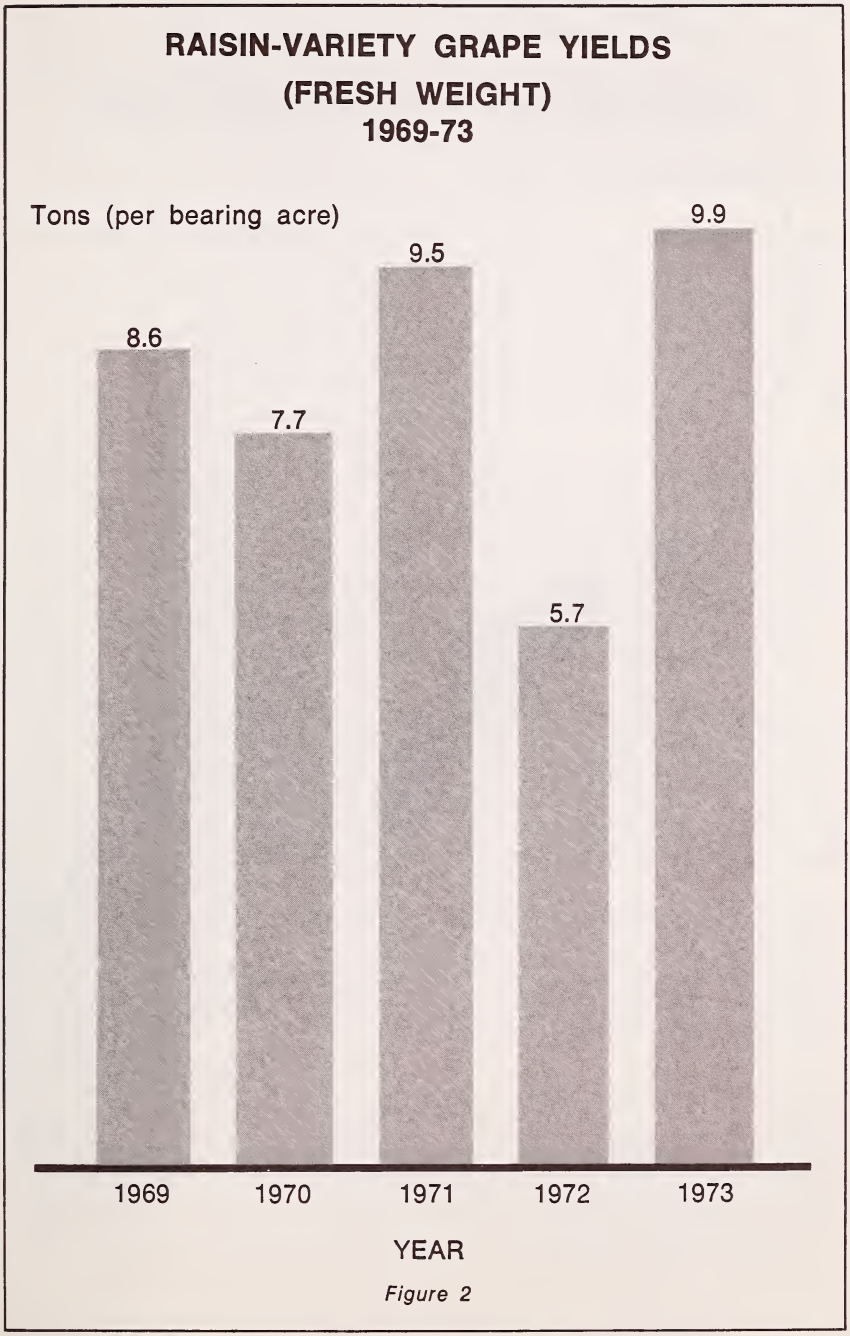

Figure 2

Raisin production areas. California's raisin industry is located primarily in the San Joaquin Valley of central California. Most of this production is centered in Fresno County. However, small tonnage is produced in the Coachella Valley of southern California. Figure 3 shows the two production areas.

Figure 3

RAISIN VARIETIES AND TYPES

The more common types of raisins are natural Thompson seedless, golden seedless, sulfur bleached, dipped, natural muscat, layer muscat, valencia, monukka, zante currants, and natural or artificially dehydrated sultanas. However, the most important of these is the natural Thompson seedless, golden seedless, muscat, and zante currants.

Natural Thompson seedless. Natural Thompson seedless raisins are the most popular variety and make up about 90 percent of California's raisin production. The natural Thompson seedless raisin is produced by sun-drying fresh Thompson seedless grapes. The color varies from dark blue to grayish brown.

Soda and other dipped. These raisins are produced from Thompson seedless grapes. The grapes are dipped in a heated caustic solution or hot water to remove the natural waxy coating of the fruit and to produce slight breaks in the grape skins. This allows the grapes to dry faster during the following artificial dehydration process. The resultant raisins are slightly lighter than, but closely resemble, natural Thompson seedless in color and their uses are closely parallel to natural Thompsons.

Golden seedless. Golden seedless raisins are also produced from Thompson seedless grapes. These grapes are processd in a manner similar to soda dipped raisins. However, following the dipping process, and while still moist, they are moved into a sulfur house and exposed to fumes of burning sulfur. After this they are artificially dried and the resultant raisins vary in color from dark to golden yellow. They are used mainly in baked goods, and are popular for use in fruit cakes.

Muscat. Muscat raisins are sun-dried muscat grapes. They are large and sweet and contain seeds. Color varies from bluish black to dark reddish brown. Muscat raisins are marketed in three forms: loose, seeded, or layered. Loose muscats have no stems, but the seeds are intact. Seeded muscats have both stems and seeds removed. Layered muscats are unstemmed and left in bunches. They are used primarily in dried fruit gift packs.

Valencia. Valencia raisins are produced by artificially drying muscat grapes. Their color varies from reddish brown to greenish tan.

Sultana. California's sultana raisins are made by sun-drying the nearly seedless sultana grapes. They resemble natural Thompson seedless raisins, but are less plump and contain more acid and, occasionally, semi-hard seeds.

Monukka. Monukka raisins are produced by sun-drying monukka grapes. They are usually large, dark, and plump.

Zante currants. Zante currants (sometimes referred to as black corinth grapes) are sun-dried. They are dark and very small—about one-fourth the size of natural Thompson seedless raisins. Unlike other raisins, they are tart and are mainly used in baked goods.

CULTURAL PRACTICES

Many considerations and decisions must be made before one goes into commercial grape production. Location, the proper variety of grapes for that location, the cultural methods to use, and the marketability of the crop are basic.

Land preparation. Before planting, the land must be cleared. Land that must be irrigated should be leveled and graded.

Vineyard planning. Long, uniformly spaced rows make cultivation easier and cheaper. Irrigated vineyards require more planning as to slope, row length, and the source and volume of water supply.

Vineyard planting. One-year old rootings or cuttings are generally used to plant vineyards. Wide-row spacing reduces harvesting, pruning and brush disposal costs, permits the use of mechanical equipment, and provides more space for irrigation. Thompson seedless vineyards generally have 12 feet between the rows with the vines 6, 7, or 8 feet apart.

Vine productivity depends upon the variety, soil, climatic conditions, and cultural practices. Thompson seedless vines reach bearing age after 3 years, and are fully mature in 4 to 5 years.

Vine training. The most important goal in establishing a vineyard is to develop vines with strong, well-formed root systems. This is done by using the proper vine training procedures during the first 4 years.

Pruning. Vines are pruned when dormant, usually from December 1 to March 1. Canes, shoots, leaves, and other vegetative parts of the vine are removed. This helps establish and maintain the vine structure. When Thompson seedless vines are pruned, four to six canes are left on each vine, depending on the vine and soil conditions. After pruning, the remaining canes are tied to trellis wires.

Irrigation. The San Joaquin Valley receives very little rainfall—about 6 to 11 inches a year, mostly during winter months. Summer months are usually hot and dry. Thus, vineyards may require up to 10 irrigations per year, depending on the weather, soil, cultural practices, and the variety of grapes grown. Irrigation is stopped a week or two before harvest begins. A final irrigation is given after harvest if the summer has been very hot.

Fertilizing. Grapevines can adapt to a wide range of soil fertility. Compared to many horticultural crops, they do not have high nutritive requirements. Of the 15 elements known to be necessary for normal growth and fruiting, only four are deficient in the soils of California vineyards. These are nitrogen, potassium, and two trace elements—zinc and boron. Proper application of fertilizers can correct these deficiencies.

Grape diseases. Grapes are susceptible to many diseases, and control is difficult in humid summer weather. Many fungus diseases, such as powdery mildew, dead arm disease, black measles, and black mold rot affect the vine and fruit in California.

Several types of fungi attack the vine's roots. The more common are oak root fungus, ozonium root rot, and collar rot in young vines.

Some of the virus diseases that affect vineyards are Pierce's disease, fan leaf, yellow mosaic, yellow vein, leaf roll, and asteroid mosaic.

Grape pests. About 30 insects and pests are known to attack grapevines. Insects that attack the leaves are the grape leaf hopper, omnivorous leaf roller, Pacific and Willamette mites, western grape leaf skeletonizer, and grasshoppers.

Several insects attack the flowers and fruit of the vine. The most common are thrips and drosophila. Two of the more significant insects that attack the roots are phylloxera and the root knot nematode.

Raisin insects. Raisin deterioration is usually due to insect infestation. The most common insects are the raisin moth, Indian meal moth, dried fruit beetle, and the saw-toothed grain beetle.

Advisory service. Detailed information on vineyard cultural practices can be obtained from the Cooperative Extension Service office in each county where grapes are grown.

HARVESTING

Most raisins produced in California are sun-dried in the vineyards using these steps:

Land preparation. Before harvest, growers disc the soil to remove weeds and level the loose soil between vines. This provides a place for the grape-drying trays. Generally, the vineyard rows run in an east-west direction and the soil is pushed to the northern side of the row, sloping to the south. This is called terracing and exposes the grapes to more direct sunlight to hasten the drying process.

Harvest time. The raisin harvest usually begins in early August when zante currants ripen. From mid-August to mid-September, Thompson seedless and sultana grapes ripen. Muscat grapes begin to ripen in early September.

Ripening time is determined by the amount of time in which temperatures remain above 50 degrees after full bloom. The yield and quality depend on the maturity of the grapes from which the raisins are made. Grapes that have higher sugar content are usually more mature and produce better quality raisins with low drying ratio and higher yields.

Harvest time is critical because the grapes must be mature and the weather hot and dry. If it rains on the raisins during the drying period, they may be damaged by mold.

Trays. Formerly, grapes were placed in wooden trays for drying. These trays are still used for drying muscat grapes. However, they have been replaced by standard 2x3 foot paper trays for drying other varieties of grapes. If the grapes are mechanically harvested, a continuous paper tray is laid between the rows.

Raisin lay. Pickers cut grape bunches from the vines and place them on drying trays between the rows. Mechanical harvesters are becoming more and more adapted for this harvesting process. The grapes are spread out on the trays to give each bunch maximum exposure to the sun for drying purposes.

After a week or so on these trays, with daytime temperatures of 90 to 100 degrees, the grapes begin to dry and resemble raisins. In another week, the grapes are turned over on the trays to finish drying. The paper trays are then rolled up in a tight roll around the raisins. Since there is often a mixture of moist and dry bunches, rolling will allow the raisins to dry out a little more without sunburning or carmelizing those that have already dried.

Figure 4.—Grape bunches are placed on trays between vine rows to dry in the sun.

When thoroughly dried, the raisins are put into containers and delivered to processing plants.

Figure 5.—Rolled in drying trays, raisins complete the sun-drying process before moving to processing plants.

MARKETING

FARM SALES

Prior to 1900, raisin sales between growers and packers were primarily on an individual basis. Various attempts to organize a cooperative raisin packing plant resulted in the formation of the California Associated Raisin Company in 1912. The name was changed to Sun-Maid Raisin Growers of California in 1922.

In 1967, the Raisin Bargaining Association, a cooperative, was formed to bargain with independent raisin packers for prices on Association members' raisins. The Association has grown steadily since 1967 and now handles bargaining functions for practically all raisin producers who are not members of growers cooperatives.

Table 4 shows the amount of raisins produced, season average producer price, and the value of annual production for specified periods of time.

Table 4.—Raisins: Production, price, and value

Crop	Dried production	Season average producer price	Value of production
	tons, before processing	*$1.00*	*$1,000*
Averages			
1950-54	217,400	184	38,502
1955-59	201,200	227	22,774
1960-64	222,000	224	48,829
1965-69	249,200	247	60,433
Annual			
1965	270,000	200	54,000
1966	280,000	206	57,680
1967	181,000	297	53,757
1968	264,000	265	69,960
1969	251,000	266	66,766
1970	193,000	283	53,847
1971	191,000	329	62,839
1972	105,000	560	58,800
1973	224,000	754	168,896
1974	240,000	632	151,680

PROCESSING

Two marketing cooperatives and sixteen packers processed the 1974 raisin crop. The processing operation can be broken down into four different stages: cleaning, grading, washing, and a final hand-picking. Most raisins are delivered to processing plants in one of three types of containers: picking boxes, sweat boxes, or bins. Picking boxes hold about 50 pounds, sweat boxes around 150-160 pounds, and bins about 1,000 pounds.

Sun-dried raisins. Field-run raisins are dumped into a hopper and are conveyed by belt into a drum where they are broken loose from the main stem. They then pass over a shaker screen which removes sand, chaff, and stems. The raisins are elevated to another shaker and dropped into an air stream to remove light-weight fruit and other light material, such as stems. From this point, they are further cleaned or air separated by a vacuum or blowers. They are then sorted by size. Capstems are removed by an abrasive process, and the raisins are then washed, dried, and given a visual inspection before packaging.

Raisins which contain mature hard seeds are further processed to remove the seeds. This is done by first heating the raisins in

order to soften them so that the seeds can be removed without undue damage to the raisins.

Artificially dried raisins. Grapes that are to be artificially dried are placed in field containers and hauled to a dehydrator. The loose stems and grape leaves are picked out, and any undersized or damaged bunches are removed. The fresh grapes go through a hot caustic solution which removes the natural waxy coating and makes tiny cracks in the skins to speed up the drying process. The grapes are then spread onto long shallow wooden trays and stacked on metal carts.

At this point, grapes that are to be processed into golden seedless raisins are moved into houses where they are exposed to the fumes of burning sulfur. They remain in the sulfur house from 4 to 5 hours to prevent darkening and are then moved into dehydrating tunnels and dried for about 18 hours.

Soda-dipped and valencia raisins are similarly produced but do not go through the sulfuring process. Hot water dipped raisins are produced in much the same manner as soda-dipped raisins except that the fresh grapes are dipped in a plain hot water solution. Sulfur bleached raisins are also similarly produced but are sun-dried.

Processed raisins are placed in bulk containers or consumer-size cartons or bags. Bulk size containers hold 10, 25, 30, 40, or 1,500 pounds. Consumer carton sizes range from one-half ounce to 30 ounces. Consumer bags range from 1 ounce to 5 pounds. The cases, cartons, and bags are filled and weighed automatically.

INSPECTION AND GRADING

Through the Federal raisin marketing order, the U.S. Department of Agriculture inspects all California raisins.

USDA grade standards serve as a common language to expedite trading and help establish the value of the product. Grade A is top or best quality, Grade B good quality, and Grade C lower quality but a thrifty buy when appearance is unimportant.

Raisins are inspected at least twice as they move from the producer through marketing channels. The first inspection is conducted as the natural condition raisins are delivered to the packer. The second inspection is done at the packing plant while the raisins are readied for shipment. Both incoming and outgoing raisins must meet minimum quality standards as required by the Federal raisin marketing order. Both inspections require that the raisins come from sound, wholesome, and fairly mature grapes; are free from insect infestation; have a normal characteristic color, flavor, and odor; do not exceed a certain maximum moisture content; are of a certain maturity; and do not exceed the limits for certain quality defects.

USDA inspectors examine the raisins as they are delivered to the packers.

Outgoing inspection is also conducted by USDA inspectors who use laboratories furnished with modern equipment to make final inspections.

Figure 6.—USDA has an inspection laboratory in each processing plant. Here raisins are tested for evidence of mold, sand, or other imperfections. All U.S. raisins must meet rigid government tests.

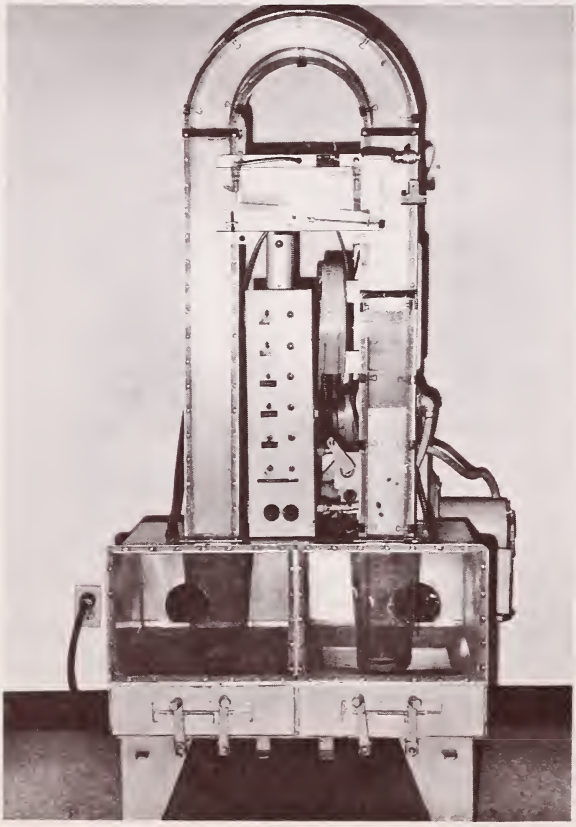

Figure 7.—An airstream sorter in the inspection laboratory sorts raisins by density and maturity.

DOMESTIC MARKETING

Buyers in the domestic raisin market are categorized as: (1) Retail; (2) Industrial-institutional (including mass feeders, cereal makers, bakers, confectioners); and (3) Government (military, post exchanges, school lunch programs, etc.). Raisin use determines the variety and packaging preference each customer buys. For example, many retail chain stores buy a specific grade and use the store's own private label or brand. Industrial-institutional users generally order supplies in large bulk fiber containers.

Some packers maintain their own sales departments, while others sell through food brokers. Brokers are independent sales agents, acting for the packer, and are paid on a commission basis.

Most raisin shipments move to the domestic market by either rail or truck. To speed delivery, many packers maintain an inventory of raisins in the eastern part of the country. About 34 percent of the total production goes to the domestic market in consumer-size packages while about 40 percent moves to the industrial-institutional market. The most popular varieties are: Thompson seedless, golden seedless, zante currants, and muscats.

Table 5.—California raisin shipments: Domestic and export by types of packages, and by variety and type (packed weight) 1969-74

Crop Year	Domestic shipments					Export shipments			Yearly Totals
	Cartons	Bags	Bulk	USDA (purchases)	Other U.S. Gov't purchases	Cartons	Bags	Bulk	
	—Tons—					—Tons—			
1969-70	50,776	12,437	71,585	20,266	823	17,536	78	46,720	220,211
1970-71	50,096	13,158	70,580	2,937	1,613	17,116	52	40,811	196,363
1971-72	53,067	14,295	73,708	4,138	612	18,442	100	48,362	212,724
1972-73	38,065	7,949	56,539	–0–	127	8,471	112	8,262	119,525
1973-74	62,649	13,710	67,846	–0–	85	16,415	442	24,173	185,320

Crop Year	Shipments by variety and type							Yearly Totals
	Natural Thompson seedless	Muscats	Sultanas	Golden seedless	Soda dipped	Zante currants	Others	
	—Tons—							
1969-70	200,931	1,653	427	13,697	59	2,755	689	220,211
1970-71	177,898	1,296	415	13,346	16	2,993	399	196,363
1971-72	193,641	1,120	319	13,814	42	3,147	641	212,724
1972-73	104,918	973	192	11,324	415	1,355	348	119,525
1973-74	163,907	1,370	180	13,586	4,056	1,814	407	185,320

Table 6.—Raisins and currants: Exports from United States

(In short tons)

Country of destination	Year beginning September 1					
	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
Europe						
EEC						
Belgium-Luxembourg	941	1,094	964	760	1,153	738
France	384	612	670	402	534	221
Germany, West	2,743	2,485	2,568	3,308	4,870	2,098
Italy	10	291	—	97	3	2
Netherlands	1,027	1,248	1,077	1,169	1,438	616
Total	5,105	5,730	5,279	5,736	7,998	3,675
Austria	32	29	35	41	40	9
Denmark	3,853	3,808	3,846	2,862	3,905	1,479
Finland	4,377	4,574	3,069	1,851	3,577	1,577
Iceland	297	278	301	228	285	56
Ireland	1,351	1,890	1,833	1,102	1,057	98
Norway	2,202	2,611	1,851	1,643	1,734	665
Sweden	3,925	3,559	3,536	3,541	4,285	1,661
Switzerland	673	816	609	634	956	533
United Kingdom	11,264	9,518	10,340	10,164	10,442	1,808
Other	3	—	9	18	13	9
Total Europe	33,082	32,813	30,708	27,820	34,292	11,570
Latin America						
Bolivia	41	32	40	35	38	6
Brazil	492	405	369	527	459	420
Colombia	13	2	6	12	11	2
Costa Rica	77	64	68	57	60	28
Dominican Republic	70	137	60	133	112	77
Ecuador	222	197	142	79	167	61
El Salvador	29	35	12	20	33	5
Guatemala	58	69	51	48	56	31
Honduras	27	21	27	23	28	14
Mexico	1,299	2,666	4,993	375	2,926	424
Nicaragua	31	30	13	7	10	9
Panama	218	216	172	197	159	64
Peru	270	121	50	6	—	—
Venezuela	1,281	1,028	1,030	926	1,054	420
Other	12	12	21	7	15	12
Total	4,140	5,035	7,054	2,452	5,128	1,573
Other countries						
Australia	1	2	—	—	—	19
Canada	6,390	5,473	6,099	6,408	6,460	4,454
Hong Kong	702	594	838	979	930	106
Japan	18,418	20,875	23,763	18,741	21,761	4,240
Malaysia & Sing.	884	979	1,062	815	588	162
Nansei & Nanpo Is.	271	371	369	180	130	—
Neth. Antilles	128	62	39	41	62	40
New Zealand	1,190	1,593	1,699	1,526	1,482	536
Philippines	1,913	1,545	871	1,116	957	204
Taiwan	1,106	1,141	1,599	1,628	1,308	91
Viet-Nam	90	1,026	343	—	341	113
West Indies	194	218	217	184	148	94
Other	687	257	326	561	556	174
Total	31,974	34,136	37,225	32,179	34,723	10,233
Grand total	69,196	71,984	74,987	62,451	74,143	23,376

Though the United States is the world's largest producer of raisins, the Nation also imports some raisins each year. They come primarily from Afghanistan, Australia, Greece, Iran, South Africa, and Turkey. Imports averaged less than 2 percent of domestic production in the 1969-73 period.

EXPORT MARKETING

The primary destinations of raisin exports during the 1967-72 crop years are revealed in table 6. About one-fourth of California's total raisin shipments were exported during this period. Consumer-size packages accounted for only a small percentage of the shipments since most moved in industrial-institutional size containers.

Most exports go by rail or truck to ports (usually San Francisco-Oakland or Stockton, Calif.), where they are loaded aboard ship. Some of the new ocean vessels can cross the Pacific from San Francisco to Japan in 9 to 10 days.

MARKETING ORDER PROGRAMS

Raisin marketing orders are authorized by both Federal and California legislation. The California raisin industry initiated both programs in 1949.

The Federal raisin marketing order is administered locally by a 15-member Raisin Administrative Committee under supervision of USDA. This committee, whose office is located in Fresno, is advised by a 46-member Raisin Advisory Board. Members of this board are elected by the group they represent and committee members are elected from the board membership.

Program regulations under the Federal marketing order specify minimum grade standards on raisins handled by the packers. The regulations may also allocate the percentage of the raisin crop that can be marketed both domesitcally and in neighboring export markets. The committee studies supply and demand conditions and recommends to the Secretary of Agriculture regulations to apply each year, with the Secretary making the final decision on regulations issued. Cost of the program is paid for by an assessment levied on the raisin packers.

The State marketing order program is administered by the 14-member California Raisin Advisory Board (CALRAB), whose office is also in Fresno. This program concentrates on generic (nonbrand) market development (including paid advertising), and research projects on production, processing, and marketing. In handling research projects, CALRAB has entered into contracts with USDA and the University of California at Davis and Berkeley, and California State University, Fresno. CALRAB research projects include investigations on mechanical harvesting, drying grapes on the vine prior to mechanical harvesting, biological insect control, nematodes, transportation, and raisin packaging. Cost of this program is paid for by assessments levied on the growers and packers.

RESEARCH

The California State University, Fresno, School of Agricultural Sciences conducts its own independent research in addition to cooperative research with USDA. The university tests new varieties, cultural practices, irrigation, fertilization, and harvesting methods. The university's viticulture department has its own raisin packing plant on campus, and regularly offers college courses in raisin production. The University of California Cooperative Extension Service conducts research on grape growing and raisin production, including production costs and correlating grape sugar levels with raisin yield.

USDA's Agricultural Research Service, Western Region, Stored-Product Insects Research Laboratory in Fresno researches insect problems. USDA also has a horticultural crops field station near Fresno that recently developed the new Fiesta raisin variety, and continues to work on developing other new varieties.

WORLD PRODUCTION AND TRADE

The world's major raisin-producing countries, listed in order of importance, are the United States, Greece, Turkey, Australia, Iran, Republic of South Africa, and Spain.

There are two groups of raisin-producing countries, one in the Northern Hemisphere, and the other in the Southern Hemisphere. The Northern and Southern Hemisphere's growing and harvesting seasons are 6 months apart. When Australia growers are harvesting their grapes, California growers are pruning and preparing for a new crop year.

Table 7.—Raisin exports from seven leading producing countries, 1970-74 marketing years[1]

(In thousands of metric tons)

Country	1970	1971	1972	1973	1974[2]
Australia	56.9	44.9	74.1	39.8	36.0
Greece	58.0	84.7	55.5	46.0	65.0
Iran	37.2	40.0	37.0	30.0	34.0
Republic of South Africa	7.6	7.1	5.9	7.9	2.0
Spain	2.7	1.7	1.5	2.2	2.0
Turkey	82.8	98.2	110.6	58.0	58.0
Foreign total	245.2	276.6	284.6	183.9	197.0
United States	56.7	67.3	21.2	45.2	48.0
Grand total	301.9	343.9	305.8	229.1	245.0

[1] Marketing year beginning August and September for Northern Hemisphere countries and January for Southern Hemisphere countries.
[2] Estimate.

SUMMARY

The United States is the world leader in raisin production and all U.S. raisins are produced in California. Commercial production began in 1873, expanded steadily until the early 1920's, when it reached a level near 225,000 tons per year, and has since fluctuated around that level. In 1973, California had 238,544 bearing acres of raisin-variety grapes, concentrated in the San Joaquin Valley. Grapes produced from this acreage were used for raisins, wine, and canning, or sold fresh.

There are many different varieties of California raisins. The natural Thompson seedless raisin is the most popular and constitutes about 90 percent of California's production. Other important varieties are golden seedless, muscat, and zante currants. California raisins are inspected for quality twice by USDA—first at the packing plant as they are received from the growers and second as they are processed by the packers.

California raisins are sold to more than 50 countries throughout the world. For the crop years, 1969-74, raisin exports accounted for about 26 percent of all raisin shipments while annual raisin imports amounted to less than 2 percent of California's total production. In the domestic market, for the same period, about 34 percent of the raisin shipments were packed in retail consumer-size packages and about 40 percent in industrial-institutional packages for use by candy makers, cereal makers, bakeries, and mass feeders.

California's raisin industry utilizes a Federal marketing order and a State marketing order. The Federal order regulates minimum quality and formulates an annual marketing policy that may include market allocations. The State order concentrates on research and market development, including generic advertising. Research on raisins is carried out by California State University, Fresno, the University of California Cooperative Extension Service, and USDA.

The United States produces about 30 percent of the world's raisins. The other major producing countries are Greece, Turkey, Australia, Iran, Republic of South Africa and Spain. Growing seasons are reversed in the Southern and Northern Hemispheres. Thus, countries in the Northern Hemisphere are pruning and growing their crop while the Southern Hemisphere is harvesting and marketing theirs.

RAISIN INFORMATION SOURCES

Organization	Publications and Information
California Crop and Livestock Reporting Service P.O. Box 1258 Sacramento, Calif. 95806	Gathers and disseminates crop statistical reports. Annual reports: Marketing California Dried Fruit Grapes, Raisins & Wine California Fruit & Nut Statistics California Fruit & Nut Acreage Fruit Summary Periodic Reports: Grapes for Crushing Grape Acreage Report Fruit Production
California Raisin Advisory Board P.O. Box 5335 Fresno, Calif. 93726	State of California Raisin Marketing Order, which includes promotion, advertising, and research. Raisin recipes, raisin nutrition information, raisin production and marketing research, advertising, and promotion reports.
California State University, Fresno Fresno, Calif. 93740	College of Agriculture Department of Viticulture. College courses in viticulture and raisin making. Research in cooperation with USDA, California Raisin Advisory Board, and others.
Farm Advisors Fresno County—1720 S. Maple Fresno, Calif. 93702 Tulare County—County Civic Center Visalia, Calif. 93277 Madera County—128 Madera Avenue Madera, Calif. 93637	University of California Cooperative Extension Service. Extension advice. Technical and Practical publications on production.

RAISIN INFORMATION SOURCES—cont.

Organization	Publications and Information
Federal Raisin Administrative Committee P.O. Box 2229 Fresno, Calif. 93720	Federal Raisin Marketing Order, includes quality controls, volume controls, research, and development. Periodic reports on production, shipment, annual inventory, and market policy reports.
Federal-State Market News Service 1220 N Street Sacramento, Calif. 95814	Gathers and disseminates price, production, delivery, supply, and other marketing information. Periodic raisin reports.
USDA Agricultural Marketing Service, Fruit & Vegetable Division Fresno Marketing Field Office 1130 "O" Street, Rm. 3114 Fresno, Calif. 93721	Administers Federal Raisin Marketing Order. Marketing order publications.
Processed Products Standardization and Inspection Branch 1130 "O" Street, Rm. 3408 Fresno, Calif. 93721	Inspection and grading services. Development of grade standards. Inspection information, U.S. standards.
Specialty Crops Branch Washington, D.C. 20250	Marketing order publications.
USDA Foreign Agricultural Service Washington, D.C. 20250	Promotion and expansion of exports. Participation in formal trade negotiations on access to markets and tariff regulations. Maintains a global reporting and analysis network of attaches. Makes analysis of exports and imports. Foreign production & market reports. Foreign Agriculture circulars. Special reports.

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